BEHAVIOUR

How much do delayed healthcare seeking, delayed care provision, and diversion from primary care contribute to the transmission of STIs?

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Objectives: To quantify the contribution of patient delay, provider delay, and diversion between services to delayed access to genitourinary medicine (GUM) clinics. To describe the factors associated with delay, and their contribution to STI transmission.

Methods: Cross-sectional survey of 3184 consecutive new patients attending four GUM clinics purposively selected from across England to represent different types of population. Patients completed a short written questionnaire that collected data on sociodemographics, access, and health-seeking behaviour. Questionnaires were then linked to routinely collected individual-level demographic and diagnostic data.

Results: Patient delay is a median of 7 days, and does not vary by demographic or social characteristics, or by clinic. However, attendance at a walk-in appointment was associated with a marked reduction in patient delay and provider delay. Among symptomatics, 44.8% of men and 58.0% of women continued to have sex while awaiting treatment, with 7.0% reporting sex with >1 partner; 4.2% of symptomatic patients reported sex without using condoms with new partner(s) since their symptoms had begun. Approximately 25% of all patients had already sought or received care in general practice, and these patients experienced greater provider delay.

Conclusions: Walk-in services are associated with a reduction in patient and provider delay, and should be available to all populations. Patients attending primary care require clear care pathways when referred on to GUM clinics. Health promotion should encourage symptomatic patients to seek care quickly, and to avoid sexual contact before treatment.

Since the mid-1990s, the UK has experienced a resurgence in the incidence of sexually transmitted infections (STIs)[1 2] after the historically low levels that followed the advent of AIDS in the early 1980s.[3] This burden has created poor access to the national network of genitourinary medicine (GUM) clinics,[4 5] despite increasing productivity and work intensity.[6]

Over the same period, the role of primary care in the control of STIs has increased in prominence, with an English National Strategy for Sexual Health and HIV aimed at increasing the provision of STI care in the primary care setting.[7–9] The strategy proposed that all general practice (primary care) services should provide 'Level One' care, including STI testing for women, and the assessment and referral of men with STI symptoms. The professional associations for doctors in primary care and GUM clinics have produced joint guidelines for the management of STIs in primary care,[10] but these are not compulsory, and are neither audited nor incentivised. A framework of 'Recommended Standards for Sexual Health Services'[11] commissioned by the Department of Health recommended well defined care pathways for the treatment and follow-up of individuals diagnosed with STIs outside the GUM clinic setting. Tests for STIs, with the exception of microscopy, are generally available in primary care, but are variably used.[12 13] GUM clinics treat on the basis of aetiological diagnoses, but the extent to which this happens in primary care is unclear.

There is limited evidence on the extent to which STIs are currently diagnosed and/or managed in primary care,[13 14] and no routine surveillance of primary care diagnoses or management practices. Small-scale studies have suggested that up to 40% of new patients might attend their GP surgery before attending the GUM clinic,[15] while other data suggest that men are often treated syndromically in the primary care setting.[14]

Patients who cannot easily access curative services for acute STIs are at risk of prolonged periods of infectivity, which increases the likelihood that they will further transmit their STI.[16 17] We present the results of a large-scale survey of GUM patients with linkage to clinic data in four contrasting geographic and health service settings, which quantifies the contribution made by patient delay, provider delay, and diversion between services to delayed access to GUM services, and focuses on the potential role of delay in STI transmission.

METHODS

Population and sampling

Seven GUM clinics across England were purposively recruited, representing contrasting demographic, geographic and service configuration characteristics likely to affect sexual health need and use of services. These included a London clinic, large provincial cities with single and with multiple clinics, a city with a substantial Asian population, and clinics serving rural populations. These clinics operated differing access policies. All offered some degree of triage to identify patients needing more urgent care. Two offered the majority of their slots as 'walk-in' (ratios of 9:1 for men and 5:1 for women in one clinic, and 5:1 for all patients in the other clinic). Three clinics were excluded from the analysis due to low response rates (17.8% to 24.5%), thought to be due to reception staff not offering questionnaires to all new patients. There was no significant difference between

these excluded clinic samples in the proportion with STI diagnosis or other characteristics, with the exception only that the women in the included samples were more likely to report daily work or college, and to go the clinic from home rather than elsewhere.

The protocol required that all new patients were given written information about the study by the receptionist, and invited to complete a short, 22-item self-completion written questionnaire in English (The questionnaire is available as supplementary material from http://sti.bmj.com/supplemental). This questionnaire explored patients' health-seeking behaviour and contact with services in relation to their current problem(s). In order to protect confidentiality, questionnaires were anonymous apart from the clinic identification number that was used to link the questionnaire to the clinic's routine database to obtain patient's gender, age, ethnicity, partial postcode, STI diagnosis/es and whether or not the STI was homosexually acquired.

Data collection took place from October 2004 to March 2005, with a shorter collection period in the larger clinics. The denominator for each clinic is estimated as the number of new clinic numbers issued minus, if applicable, those issued in the week in November 2004 when the Department of Health conducted its Waiting Time Survey, as questionnaires were not distributed during this week.[18]

Defining delay

We analysed delayed access to GUM clinics in terms of 'patient delay' in seeking care, and 'provider delay'. Patient delay is defined as waiting >7 days to seek care from when symptoms began, as this corresponds to the median for men and women. By definition, patient delay is only applicable to patients reporting symptoms at clinic visit and/or that their reason for going to the clinic was because 'I have (or have had) symptoms (e.g. itching, discharge)'. Provider delay is defined as waiting >4 days from first contacting any health service to being seen at the study clinic. While arbitrary, this figure corresponds to waiting 48 h to be seen at the study clinic, which is a Department of Health target,[19] while allowing an additional 48 h for those who try to seek care from other health settings (e.g. general practice) and/or to allow for delays caused by clinic access only available on weekdays. We consider these two outcomes as binary variables.

Statistical analysis

We used the Chi-square statistic to determine statistical significance, which is considered as $p<0.05$ for all analyses. We also used logistic regression to obtain crude and adjusted odds ratios (OR) for reporting the two delay outcomes (table 1) and having STI(s) diagnosed at the study GUM clinic (table 2). We entered the factors hypothesised as associated with delay (table 1) into a multivariate logistic regression model, and used forward stepwise selection to identify a parsimonious model of key factors associated with a STI diagnosis. To increase the efficiency of this model we collapsed categories where no statistical difference in parameters was found. Analyses were undertaken using the survey commands in STATA 8.0 (Statacorp, Texas, USA) to take account of clustering by clinic.

Ethical approval was obtained from South West Multi-Centre Ethics Committee.

RESULTS

Sample characteristics

3685 questionnaires were completed in the four clinics presented, of which 3184 (86.4%) could be linked to clinic data, resulting in a sample of 1624 men and 1560 women. The combined estimated mean response rate was 52.5%, with a range from 41.0% to 70.1%. The demographic characteristics of this sample are shown in the supplementary material (http://sti.bmj.com/supplemental). Just over half (52.2%) of women and 37.3% of men were under the age of 25, a quarter were cohabiting, while 16.3% women and 10.4% of men had childcare responsibilities. The sample was relatively well educated, with over a third of respondents aged 21 or over reporting a degree as their highest educational qualification. A total of 93.1% of women and 87.3% of men were registered with a general practitioner (GP). There was, as shown by the supplementary material (http://sti.bmj.com/supplemental) and as planned, much variation in many of the background characteristics by clinic. There was however no evidence of differences between new attendees who completed the questionnaire and those who did not, with respect to routinely collected data on gender, age, ethnicity and whether or not STI(s) were diagnosed.

Proportion with STI diagnosis/es at the study GUM clinic

Overall, 38.1% of men and 28.4% of women had at least one acute STI diagnosed at the study GUM clinic (as defined in table 1), a significant gender difference ($p = 0.0075$). These proportions varied by clinic among men (range 31.4%–42.3%) and women (range 24.1%–30.1%). Half (52.7%, 95% CI 47.0% to 58.3%) of the 2908 individuals answering the question on symptoms reported having, or having had, symptoms at the time of clinic visit. Symptomatic individuals were more likely to have an acute STI diagnosed than others (43.8%, 95% CI 35.0% to 53.0%, against 20.3%, 95% CI 17.2% to 23.8%, $p = 0.0028$).

Estimating delay

Table 1 presents comparative data on patient delay and provider delay, along with their associations. Median patient delay was 7 days in men and women. This did not vary by age, or ethnicity, nor according to whether the patient had STI(s) diagnosed, or GP registration status. There was no association with cohabitation status, childcare responsibilities, or working/attending college during the day, and either patient delay or provider delay. However, patients who reported attending as a 'walk-in' experienced substantially shorter patient delay. The proportion of respondents reporting that they were 'walk-in' varied between clinics from 10.4% and 94.4% among men, and from 9.8% to 86.1% among women.

Median provider delay was 7 days for men and for women, although this varied substantially by clinic, from 0–21 days overall. A total of 29.4% of all patients were seen at clinic on the same day that they tried to contact any health professional for their problem. In terms of the Department of Health's targets, a further 10.2% were seen within 48 h of contacting any health professional, although not the same day. Just over half (51.1%) of patients waited at least a week between first seeking care from any health professional to being seen at the study GUM clinic.

Provider delay was overall substantially greater among patients reporting a booked appointment (medians of 14 days versus 1 day, respectively), and those who had tried to use their GP for their current problem experienced significantly longer provider delay (medians of 10 days versus 4 days), even after adjustment for the factors in table 1.

The duration of symptoms by the time of attending clinic is highly variable in men and women. A total of 26.7% (95% CI 14.4% to 44.2%) of patients had been symptomatic for <1 week, 14.4% (95% CI 6.1% to 30.2%) 7–13 days, 20.8% (95% CI 13.3% to 31.0%) 14–27 days, 16.6% (95% CI 8.5% to 29.9%) between 4–6 weeks, and 21.5% (95% CI 5.5% to 56.4%) over 6 weeks. The importance of delayed access to GUM services in terms of disease control depends on what additional

Table 1 Variations in patient delay* and provider delay† by selected factors

	Median time to seek help, days (mean)	% Experiencing patient delay	Crude OR (95% CI) for experiencing patient delay	Adjusted OR‡ (95% CI) for experiencing patient delay	Denominator*	Median time taken to be seen in study GUM clinic, days (mean)	% Experiencing provider delay	Crude OR (95% CI) for experiencing provider delay	Adjusted OR‡ (95% CI) for experiencing provider delay	Denominator†
All	**7 (26.3)**	**45.7%**	**–**	**–**	**916**	**7 (16.8)**	**55.0%**	**–**	**–**	**2971**
Gender:			p=0.324	p=0.225				p=0.531	p=0.984	
Male	7 (22.3)	44.3%	1.00	1.00	476	7 (16.2)	54.1%	1.00	1.00	1487
Female	7 (30.7)	47.3%	1.13 (0.82–1.55)	1.21 (0.81–1.81)	440	7 (17.3)	55.9%	1.08 (0.78–1.49)	1.00 (0.55–1.81)	1484
Age:			p=0.718	p=0.937				p=0.898	p=0.985	
<25	7 (28.1)	47.0%	1.00	1.00	389	6 (15.6)	53.6%	1.00	1.00	1327
25–34	7 (25.6)	45.8%	0.95 (0.50–1.81)	1.00 (0.38–2.66)	306	7 (18.3)	56.3%	1.11 (0.55–2.25)	1.01 (0.61–1.66)	1031
35+	6 (24.3)	43.6%	0.87 (0.46–1.66)	1.08 (0.49–2.37)	220	7 (16.1)	56.2%	1.11 (0.60–2.07)	0.94 (0.39–2.29)	610
Ethnicity:			p=0.316	p=0.633				p=0.818	p=0.865	
White	7 (27.9)	47.0%	1.00	1.00	547	7 (18.1)	56.6%	1.00	1.00	1715
Black African	7 (19.3)	39.4%	0.73 (0.51–1.05)	0.67 (0.30–1.50)	33	3 (14.5)	48.0%	0.71 (0.23–2.22)	1.07 (0.47–2.46)	125
Black Caribbean	6 (22.2)	40.4%	0.76 (0.55–1.05)	0.77 (0.37–1.60)	57	7 (14.3)	53.6%	0.88 (0.18–4.34)	0.69 (0.26–1.85)	237
Asian	10 (27.8)	54.5%	1.35 (0.70–2.63)	1.49 (0.91–2.44)	55	5 (13.3)	50.3%	0.77 (0.31–1.94)	0.75 (0.30–1.88)	177
Other/mixed	5 (23.9)	40.8%	0.78 (0.38–1.61)	0.78 (0.44–1.38)	120	2 (11.3)	42.8%	0.57 (0.17–1.99)	0.93 (0.37–2.35)	418
Walk-in or booked an appointment:			p=0.009	p=0.003				p<0.001	p=0.002	
Walk-in	6 (19.6)	38.8%	1.00	1.00	552	1 (8.2)	27.3%	1.00	1.00	1411
Booked an appointment	10 (37.3)	56.4%	2.04 (1.41–2.96)	1.98 (1.57–2.49)	353	14 (25.3)	82.4%	12.4 (8.10–19.1)	10.6 (4.84–23.0)	1479
Acute STI(s) diagnosed at GUM clinic:§			p=0.361	p=0.956				p=0.598	p=0.185	
No	7 (30.2)	46.3%	1.00	1.00	482	7 (17.1)	55.6%	1.00	1.00	1998
Yes	7 (22.0)	45.2%	0.96 (0.84–1.09)	1.01 (0.60–1.69)	434	6 (16.0)	53.9%	0.93 (0.64–1.37)	0.88 (0.68–1.12)	973
Registered with a GP:			p=0.747	p=0.403				p=0.108	p=0.592	
No	7 (17.8)	44.4%	1.00	1.00	81	4 (13.9)	49.1%	1.00	1.00	275
Yes	7 (27.3)	45.8%	1.06 (0.64–1.76)	0.80 (0.38–1.67)	829	7 (16.9)	55.9%	1.32 (0.89–1.93)	0.86 (0.39–1.90)	2600
Tried to use general practice:			p=0.815	p=0.796				p=0.007	p=0.001	
No	7 (25.3)	46.3%	1.00	1.00	560	4 (11.8)	49.7%	1.00	1.00	2063
Yes	6 (25.9)	45.3%	0.96 (0.59–1.56)	1.02 (0.79–1.32)	329	10 (29.8)	69.9%	2.36 (1.56–3.57)	3.50 (2.61–4.69)	815
Have/had symptoms:	N/A	N/A	N/A	N/A				p=0.828	p=0.129	
No						7 (15.5)	55.8%	1.00	1.00	1354
Yes						6.5 (18.2)	54.7%	0.95 (0.51–1.78)	1.53 (0.80–2.91)	1512
Self-treated symptoms:			p=0.917	p=0.771				p=0.613	p=0.794	
No¶	7 (25.4)	45.7%	1.00	1.00	637	5 (14.7)	51.9%	1.00	1.00	1059
Yes	6.5 (28.6)	45.1%	0.98 (0.53–1.79)	0.93 (0.43–1.99)	268	6 (23.6)	55.5%	1.16 (0.51–2.62)	1.13 (0.30–4.20)	380

*Patient delay is defined as reporting waiting >7 days to seek help from any health professional among those reporting symptoms at clinic visit or that they had had symptoms, and a valid number of days since their symptoms began and first seeking help/advice.
†Provider delay is defined as reporting waiting >4 days from first trying to contact any health professional and being seen at the study clinic –among all respondents.
‡Odds ratio (OR) adjusting for all factors in table 1.
§Acute STIs are defined as infectious syphilis (KC60 codes: A1, A2), uncomplicated gonorrhoea (KC60 codes: B1, B2), complicated gonorrhoea (KC60 code: B5), chancroid/lymphogranuloma venereum (LGV)/donovanosis (KC60 codes: C1, C2 & C3); chlamydial infection (uncomplicated/complicated) (KC60 codes: C4a, C4b, C4c); uncomplicated non-gonoccocal/non-specific urethritis in males (KC60 code: C4h); complicated non-gonoccocal/non-specific infection (KC60 code: C5); herpes simplex (first attack) (KC60 code: C10a); genital warts (first attack) (KC60 code: C11a); trichomoniasis (KC60 code: C6a).
¶To enable the denominator to be all respondents for the 'provider delay' outcome, those who did not report symptoms at clinic visit are included as not reporting to have self-treated symptoms. This has no significant impact on the results.

Table 2 Key factors associated with STI diagnosis/es*,† at the study GUM clinic, by gender

	Row	Crude OR (95% CI)	Adjusted OR‡ (95% CI)	Denominator
Men, all:	38.1%	–	–	1624
Age:		p=0.159	p=0.102	
16–24	38.9%	1.00	1.00	604
25–34	39.3%	1.02 (0.68–1.53)	0.99 (0.67–1.46)	603
35+	35.0%	0.85 (0.68–1.06)	0.73 (0.53–1.01)	414
Ethnicity:		p=0.007	p=0.002	
Other ethnicity	36.7%	1.00	1.00	1485
Black Caribbean	52.5%	1.91 (1.39–2.61)	2.43 (1.87–3.16)	139
Have/had symptoms:		p=0.001	p=0.037	
No	27.2%	1.00	1.00	853
Yes	50.1%	2.68 (2.10–3.43)	2.09 (1.09–4.00)	771
Had symptoms for <1 week:		p=0.024	p=0.134	
No	35.5%	1.00	1.00	1475
Yes	63.8%	3.20 (1.34–7.63)	1.80 (0.72–4.49)	149
Symptoms worsened since first contacted health professional:		p=0.001	p=0.033	
No symptoms	26.1%	1.00	1.00	766
Symptoms did not worsen (stayed the same or improved)	41.0%	1.96 (1.47–2.63)	0.95 (0.48–1.89)	337
Symptoms worsened	53.7%	3.29 (2.59–4.17)	1.68 (0.93–3.05)	521
Women, all:	28.4%	–	–	1560
Age:		p=0.052	p=0.129	
16–24	32.4%	1.00	1.00	814
25–34	24.7%	0.68 (0.55–0.85)	0.70 (0.51–0.95)	494
35+	22.6%	0.61 (0.38–0.99)	0.60 (0.30–1.17)	252
Ethnicity:		p=0.020	p=0.038	
Other ethnicity	29.0%	1.00	1.00	1488
Black African	16.7%	0.49 (0.30–0.81)	0.52 (0.29–0.94)	72
Used/tried to use general practice before going to GUM clinic:		p=0.003	p=0.003	
No	25.0%	1.00	1.00	1007
Yes	34.5%	1.58 (1.35–1.85)	1.39 (1.24–1.55)	553
Symptoms improved since first contacted health professional:		p=0.024	p=0.037	
No symptoms	18.7%	1.00	1.00	734
Symptoms improved	32.2%	2.07 (0.94–4.56)	1.74 (0.77–3.92)	633
Symptoms did not improve (stayed the same or worsened)	52.9%	4.88 (2.96–8.06)	3.65 (2.20–6.07)	193
Self-treated symptoms:		p=0.090	p=0.048	
No symptoms	20.3%	1.00	1.00	843
Symptoms but did not self-treat	40.1%	2.63 (1.44–4.80)	1.44 (0.84–2.47)	491
Symptoms and self-treated	33.2%	1.95 (1.09–3.50)	0.98 (0.53–1.84)	226

*Acute STIs are defined as infectious syphilis (KC60 codes: A1, A2), uncomplicated gonorrhoea (KC60 codes: B1, B2), complicated gonorrhoea (KC60 code: B5), chancroid/lymphogranuloma venereum (LGV)/donovanosis (KC60 codes: C1, C2 & C3); chlamydial infection (uncomplicated/complicated) (KC60 codes: C4a, C4b, C4c); uncomplicated non-gonoccocal/non-specific urethritis in males (KC60 code: C4h); complicated non-gonoccocal/non-specific infection (KC60 code: C5); herpes simplex (first attack) (KC60 code: C10a); genital warts (first attack) (KC60 code: C11a); trichomoniasis (KC60 code: C6a).
†618/1624 men and 443/1560 women were diagnosed with acute STIs at the study GUM clinic.
‡Parsimonious multivariate model identified through forward stepwise logistic regression. Odds ratios (OR) are adjusted for all variables significant in the parsimonious multivariate model. Criteria for inclusion in the multivariate model is p<0.10, except for age and ethnicity (see Methods).

potential for STI transmission is generated by delay. This in turn depends on the sexual behaviour and healthcare seeking behaviour of those requiring treatment for STIs. In our sample, 44.8% (95% CI 38.0% to 51.7%) of 614 symptomatic men and 58.0% (95% CI 46.7% to 68.5%) of 617 symptomatic women reported continuing to have sex after symptoms had begun. In our sample, 4.2% (95% CI 2.2% to 8.0%) of 1449 symptomatic respondents reported sex after their symptoms had begun with at least one new partner without using condom(s).

Factors associated with STI diagnosis/es at the study GUM clinic

An individual's potential to transmit an STI depends on having an STI. We therefore explored whether patients diagnosed with STI(s) were in fact experiencing greater patient or provider delay. However, having a STI diagnosis at the study GUM clinic was not associated with either measure of delay. Table 2 shows that in men the presence of symptoms, and in particular worsening symptoms, is helpful in predicting which patients are most likely to have STI(s). By contrast, in women, having attempted to use general practice and reporting that their symptoms had stayed the same or worsened is associated with a higher odds ratio for STI diagnosis/es at the study GUM clinic.

The role of general practice

We explored the role of general practice in the care pathway of patients reporting attempting to use their general practitioner for their STI problem (table 3). A total of 25.2% of all male and 30.9% of all female respondents reported using, or trying to use, general practice before attending the study clinic (p = 0.196 for gender difference). Patients who had tried general practice were more likely to have an STI diagnosed at the study GUM clinic than respondents who had not tried general practice (33.3% versus 25.5%, p = 0.0072). Of the 801 patients who reported trying to use general practice, 63.9% (95% CI 56.0% to 71.1%) reported actually seeing a health professional in this setting. Among the 203 patients who had seen a health professional in general practice but who were later diagnosed with acute STI(s) at the study GUM clinic, 66.0% (95% CI 54.3% to 76.0%) had received treatment in general practice, while 4.4% (95% CI 2.4% to 8.2%) had been advised to go to a GUM

Table 3 Experience of general practice before going to the study GUM clinic, by gender

	Men	Women	p Value for gender difference
Denominator*	359	442	
Went to general practice in person	70.8%	66.7%	p=0.041
Saw health professional(s) in general practice	66.3%	62.0%	p=0.226
Denominator†	238	274	
Health professional seen in general practice:			p=0.035
Doctor	5.0%	15.3%	
Nurse	62.2%	48.5%	
Doctor and nurse	14.3%	15.7%	
None reported (but reported being prescribed treatment)	18.5%	20.4%	
General practice's management of patient:			p=0.115
Prescribed treatment	65.5%	57.8%	
Advised to go to a GUM clinic	3.4%	8.2%	
Prescribed treatment and advised to go to a GUM clinic	22.8%	23.9%	
Neither outcomes reported	8.2%	10.1%	

*Denominator is those respondents with evidence of using (or trying to use general practice) before going to the study GUM clinic.
†Denominator is those reporting to have seen at least one health professional in general practice.

clinic, and 17.7% (95% CI 12.4% to 24.7%) received both treatment and advice to go to a GUM clinic. A further 10.3% (95% CI 5.9% to 17.6%) reported receiving neither treatment nor advice to go to a GUM clinic, despite having seen a health professional in general practice.

DISCUSSION

Our data show that use of booked appointments is associated with substantially increased patient and provider delay, and that the 28.0% of patients who had already used/tried to use general practice experienced longer provider delay.

It is important to acknowledge the relatively low overall response rate that was achieved, and the exclusion of clinics with particularly low response. We are also unable to report the number of patients who chose to accept a later appointment than that originally offered, a proportion that could be as high as 20% of those offered an appointment within 48 h (George Kinghorn, personal communication). We are unable to determine the extent to which GPs advised sexual abstinence or partner treatment, though existing data suggest partner notification is rarely undertaken in primary care.[20 21]

There is evidence of declining provision of walk-in services since the late 1990s.[5] Two studies have described the impact of changing appointment systems. One showed an alternative to a 'walk-in' service, which involved two-thirds of slots being bookable on the day only, to be equivalent to walk-in in terms of delay and the population seen.[22] Another, using the same methodology, documented a reduction in STIs seen following a switch from walk-in to booked appointments.[23] We are not aware of more recent studies aiming to quantify patient and provider delay in relation to STI status. A national programme of monitoring GUM clinic waiting times does not collect data on disease status, or sexual behaviour, and does not explore use of other services in detail. It shows that there have recently been modest declines in GUM clinic waiting times.[24] A number of clinics have published studies of access related factors. Data from a recent study in one clinic suggest that it was meeting only a quarter of demand.[25] Staff at one clinic that records all calls have estimated that only 25% of those who fail to attend their booked GUM clinic appointment will rebook within a month, and that rebooking is less common among teenagers (George Kinghorn, personal communication).

Our data demonstrate that inadequate access to GUM clinic services, and in particular to walk-in clinics, along with substantial rates of informal diversion from primary care following variable degrees of management, are important contributors to delayed access to care and thus to preventable STI transmission in the UK. Modelling work, and estimates of unmet demand from other clinics suggest that this is likely to be a major determinant of rising STI rates in the UK.[26] Our study demonstrates that known substantial variation in provider delay[18 24 27] between clinics is not explained by difference in patients' healthcare seeking behaviour, which vary little by clinic and by demographic characteristics. The association of walk-in appointment use with reduced patient delay and reduced provider delay suggests potential benefit in terms of reducing patients' period of infectivity. This in part reflects a selection effect (in that those individuals most capable of negotiating fast access tend to choose walk-in appointments where available). However, it also suggests that greater availability of walk-in slots can be expected to reduce patient and provider delay at the population level. Given the decline and variability in walk-in services seen in our study and reported elsewhere,[5] this suggests that a move away from open access can be expected to increase delay and thus STI transmission.

The quality of management in primary care has the potential for major impact on STI transmission in the UK, as a quarter of patients of both genders in this study, in all locations, first sought care from their GP for their suspected STI. Analysis of a large primary care database showed that large numbers of men are treated in general practice for symptoms of presumptive STI, with very few cases of chlamydia actually diagnosed.[14] If, as also suggested by our data, such cases are treated presumptively in general practice with patients nonetheless advised to go to a GUM clinic for a more thorough check-up, then patients who do not go or can not access the clinic (e.g. because of waiting times) might assume that they have been 'cured' of their infection, when in reality, some still risk onward transmission and/or re-infection. Further work to determine the extent of correct treatment is needed. There is evidence that individuals diagnosed with chlamydia in primary care are less likely to have an HIV test than those diagnosed in GUM clinics.[28] However, it should be noted that some respondents, especially those who did receive some treatment in primary care, might report being advised to go to a GUM clinic when they were in fact told to do so if their symptoms did not disappear or returned, rather than specifically in terms of that episode. In-depth analyses of primary care databases suggest that increasingly general practice is appropriately treating people diagnosed with chlamydia, with the proportion with evidence of appropriate therapy increasing from approximately one-quarter in 1995 to three-quarters in 2004, while there has

been a corresponding decline in the proportion referred to a GUM clinic.[29]

A lack of formal and fast referral to GUM clinics, or the capacity for complete STI management in the primary care setting, together leave many patients at risk of failing to obtain curative treatment and without means of ensuring appropriate treatment for their sexual partner(s). Given the high volume of patients who present first to primary care, it is essential that the commissioning of STI services care pathways as required in the 'Recommended Standards'[11] requires that either fast-track referral to a GUM clinic or other specialist services, or adequate testing and treatment in the initial setting, is provided at the first point of contact. There is a need for greater flexibility in clinic hours, which rather than invalidating our findings, suggest that STI control could require improving the immediate accessibility of services as well as increasing their capacity.

CONTRIBUTORS

JC had the original idea for the study and obtained funding. The questionnaire was jointly developed by all authors, led by LS who undertook piloting. Plans for analysis were led by CM, who undertook all data management and statistical work. CM wrote the first draft of the paper, which was revised by JC and AJ, with all authors contributing to subsequent drafts. JC and CM are joint guarantors.

The questionnaire can be viewed at the STI website at http://sti.bmj.com/supplemental.

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